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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/775,242	02/01/2001	Griffith D. Neal	8864/28	8128

7590

12/18/2002

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EXAMINER

WAKS, JOSEPH

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 12/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/775,242

Applicant(s)

NEAL ET AL.

Examiner

Joseph Waks

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 February 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II in Paper No. 4 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Drawings

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 5-7** are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The linear thermal expansion coefficient defined as $\text{in/in}/^{\circ}\text{F}$ or $^{\circ}\text{F}$ contradicts the commonly accepted definition of $\text{in/in}/^{\circ}\text{F}$ or $1/^{\circ}\text{F}$.

5. **Claims 5-7** are also rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the

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invention. For the reasons indicated above one skilled in the art would not be able to make and/or use the invention.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claim 24** is rejected under 35 U.S.C. 102(b) as being anticipated by **Hsu (US 6,081,859)**.

Hsu discloses in Figures 1 and 2 invention as claimed: a plurality of strips laminated together and having a plurality of poles 11 extending from a side thereof, wire 14 wound around the poles and a base formed by laminating a plurality of metal strips 113.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claims 1, 2, 10, 11, 13-23, and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hsu (US 6,081,859)** in view of **Dunfield et al. (US 5,774,974)**.

Hsu discloses in Figures 1 and 2 a linear stator core perform 100 having first and second end surfaces, poles 11, wires 12 wound around the poles, the perform 100 formed in a toroidal core by bringing the first and second end surfaces together (Re Figure 1). However, **Hsu** does

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not disclose the substantial encapsulating of the toroidal core and the windings with a monolithic body of phase changing material to form the stator assembly.

Dunfield et al. discloses in Figure 6 encapsulating of the toroidal core 50 and the windings 64c with a monolithic body of phase changing material 78 to form the stator assembly for the purpose of reducing resonant frequency of a disc drive motor.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the core as taught by **Hsu** and to provide the substantial encapsulation of the toroidal core and the windings with a monolithic body of phase changing material to form the stator assembly as taught by **Dunfield et al.** for the purpose of reducing resonant frequency when used in a disc drive motor.

Re claim 1, the feature of the windings providing multiple conductors crating magnetic fields when energized and the monolithic body holding the core in a toroidal shape are inherent to the disclosed structure.

Re claim 2, **Hsu** discloses the claimed invention except for packing density of the wire being between about 60-80 percent. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the density of the wire between about 60-80 percent for the purpose of optimizing the motor output without increasing the motor dimensions since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Re claims 15 and 16, the temperature of the injected material being in range of 200°F-700 °F or 550°F -650°F is inherent to the phase changing material disclosed by Nakamura et al. and

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used in the combined structure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

10. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hsu (US 6,081,859)** in view of **Dunfield et al. (US 5,774,974)** as applied to claim 10 and further in view of **Kessens et al. (US 5,554,902)**.

The combined method discloses all steps essentially as claimed. However, it does not disclose metal laminations having grain structure being oriented in the same general direction.

Kessens et al. discloses in Figures 8A and 8B metal laminations having grain structure being oriented in the same general direction for the purpose of reducing the core losses.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to improve the combined method and to provide metal laminations having grain structure being oriented in the same general direction as taught by **Kessens et al.** for the purpose of reducing the core losses.

11. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hsu (US 6,081,859)** in view of **Dunfield et al. (US 5,774,974)** as applied to claim 10 and further in view of **Kessens et al. (US 5,554,902)** and furthermore in view of **Nakamura et al. (US 5,459,190)**.

The combined method discloses all steps essentially as claimed. However, it does not disclose the phase change material having a coefficient of linear thermal expansion similar to the metal laminations.

Nakamura et al. disclose the phase change material having a coefficient of linear thermal expansion of $(2.2-3.5) \times 10^{-5}/^{\circ}\text{C}$ or $(1.22-1.94) \times 10^{-5}/^{\circ}\text{F}$ which is similar to the silicon iron and other magnetic metals used in electric machine laminated cores for the purpose of assuring a good electrical insulation of the stator core and windings while providing a good heat conduction and small thermal expansion, thus insuring high reliability of the machine.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to improve the combined method and to provide the phase change material having a coefficient of linear thermal expansion similar to the metal laminations of the combined system (Re US 5,554,902, column 5, line 13) as taught by **Nakamura et al.** for the purpose of assuring a good electrical insulation of the stator core and windings while providing a good heat conduction and small thermal expansion, thus insuring high reliability of the machine.

12. **Claims 5-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hsu (US 6,081,859)** in view of **Dunfield et al. (US 5,774,974)** as applied to claim 10 and further in view of **Nakamura et al. (US 5,459,190)**.

The combined method discloses all steps essentially as claimed. However, it does not disclose the phase change material having a coefficient of linear thermal expansion in a range of $(0.8-2.0) \times 10^{-5}/^{\circ}\text{F}$ and the thermal conductivity of at least 0.7 Watts/meter $^{\circ}\text{K}$.

Nakamura et al. disclose the phase change material having a coefficient of linear thermal expansion of $(2.2-3.5) \times 10^{-5}/^{\circ}\text{C}$ or $(1.2-1.94) \times 10^{-5}/^{\circ}\text{F}$ and the thermal conductivity of 0.188-0.7 Watts/meter $^{\circ}\text{K}$ for the purpose of assuring a good electrical insulation of the stator core and windings while providing a good heat conduction and small thermal expansion, thus insuring high reliability of the machine.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to improve the combined method and to provide the phase change material having a coefficient of linear thermal expansion in the ranges between $(0.8-2.0) \times 10^{-5}/^{\circ}\text{F}$ and the thermal conductivity of 0.188-0.7 Watts/meter $^{\circ}\text{K}$ as taught by **Nakamura et al.** for the purpose of assuring a good electrical insulation of the stator core and windings while providing a good heat conduction and small thermal expansion, thus insuring high reliability of the machine.

13. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hsu (US 6,081,859)** in view of **Dunfield et al. (US 5,774,974)** as applied to claim 10 and further in view of **Yoneshige (US 5,204,044)**.

The combined method discloses all steps essentially as claimed. However, it does not disclose the phase change material including polyphenyl sulfide.

Yoneshige discloses the phase change material 7 encapsulating windings 1 for the purpose of providing electrical insulation and water an explosion proofing of the winding.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to improve the combined method and to provide the phase change material including polyphenyl sulfide as taught by **Yoneshige** for the purpose of providing electrical insulation and water an explosion proofing of the winding.

14. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hsu (US 6,081,859)** in view of **Dunfield et al. (US 5,774,974)** as applied to claim 10 and further in view of **Iwaki et al. (US 4,116,033)**.

The combined method discloses all steps essentially as claimed. However, it does not disclose the step of rolling being performed by a roll forming machine to form the toroidal core.

Iwaki et al. disclose the method of using a roll forming machine to form the toroidal core for the purpose of mechanizing the production of the core.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to improve the combined method and to provide the roll forming machine to form the toroidal core as taught by **Iwaki et al.** for the purpose of mechanizing the production of the core.

15. **Claim 25** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hsu (US 6,081,859)**.

Hsu discloses the claimed invention except for the packing density of the wire being in a range between 60-80 percent. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the core perform with the packing density of the wire being in a range between 60-80 percent for the purpose of maximizing the motor output from the available core dimensions since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Prior Art

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Waks whose telephone number is (703) 308-1676. The examiner can normally be reached on Monday through Thursday 8 am to 5 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor R Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.


JOSEPH WAKS
PRIMARY PATENT EXAMINER
TC-2800

JW
December 16, 2002